Status of the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (Original) A method, comprising:

using optics to project an image of a reticle onto an image plane that is angled relative to a reticle plane, the reticle having more than one periodic feature therein;

detecting an interference pattern at the image plane; and

analyzing the interference pattern to obtain information regarding the optics.

2. (Original) The method of claim 1, further comprising using a grating as the periodic features.

3. (Original) The method of claim 1, further comprising using a plurality of gratings as the periodic features.

4. (Original) The method of claim 3, further comprising using at least one of basket weaves, vertical lines, horizontal lines, and tilted lines in the plurality of gratings.

5. (Original) The method of claim 4, further comprising forming at least one of vertical lines, horizontal lines, and tilted lines in a central section of the periodic features.

6. (Original) The method of claim 5, further comprising forming a basket weave pattern around the central portion.

7. (Original) The method of claim 1, further comprising recording the image on a photosensitive substrate.

8. (Original) A method, comprising:

using optics having an optical axis to project an image of a reticle having more than one periodic feature therein;

detecting an interference pattern in the image of the reticle substantially simultaneously at multiple locations and in a direction coaxial with the optical axis; and

analyzing the interference pattern to obtain characterization of the optics.

9. (Original) The method of claim 8, further comprising using rows of at least one of vertical, horizontal, and tilted lines as the periodic features.

10. (currently amended) A method, comprising:

illuminating more than one periodic pattern in an object plane of an object space of an optical system, the object plane extending over a range of depths through the object space;

using the optical system to image the periodic patterns onto an image volume; and

analyzing an interference pattern in an image of the periodic patterns formed within the image volume, whereby optical system characteristics are determined from the interference pattern.

11. (Original) The method of claim 10, further comprising tilting the image within the image volume.

12. (Currently amended) The method of claim 10, further comprising:

tilting the object plane with respect to ~~the~~ an optical axis of the optical system; and

generating a continuum of object positions as a function of field position.

13. (currently amended) The method of claim 10, further comprising tilting the image with respect to ~~the~~ an optical axis of the optical system.

14. (currently amended) The method of claim 10, further comprising:

~~tiling~~ tilting the object plane and the recorded image orthogonally with respect to each other; and

generating a continuum of object positions in one axis and focus positions in another orthogonal axis.

15. (Original) The method of claim 10, further comprising extracting an envelope of feature resolution through focus.

16. (Original) The method of claim 10, further comprising extracting astigmatism of the optical system as a function of an orientation of the periodic patterns.

17. (Original) The method of claim 10, further comprising extracting coma of the optical system as a second order distortion signature versus focus mapped across the field.

18. (Original) The method of claim 10, further comprising extracting spherical aberration of the optical system as a function of best focus difference between line sizes of the periodic patterns versus field position.

19. (Original) The method of claim 10, further comprising extracting optimum reticle or object position as a function of field position of minimum spherical aberration as seen by minimum best focus difference between line sizes.

20. (Original) The method of claim 10, further comprising analyzing the image using a dark field microscope.

21. (Original) The method of claim 10, further comprising analyzing the image using white light.

22. (Original) The method of claim 10, further comprising analyzing the image using a laser microscopic interferometer.

23. (Original) The method of claim 10, further comprising analyzing the image in a single exposure using a large aperture interferometer.

24. (Original) The method of claim 10, further comprising calculating a best focus position.

25. (Original) The method of claim 10, further comprising calculating spherical aberrations.

26. (Original) An apparatus, comprising:

an optical system;

illumination means for projecting an image of a reticle having more than one periodic feature thereon within a volume of image space;

means for detecting interference patterns in the image at different locations comprising different depths of focus within the volume of image space; and

means for analyzing the interference patterns and determining optical system imaging characteristics.